



Basic Details of the Team and Problem Statement

Ministry/Organization Name/Student Innovation: Ministry of Power

PS Code: SIH1300

Problem Statement Title: Automated Public Lighting

Team Name: RoboEmbedders

Team Leader Name: Ankita Gupta

Institute Code (AISHE): C-19344

Institute Name: Symbiosis Institute Of Technology, Pune

Theme Name: Smart Automation

Idea/Approach Details

Describe your idea/Solution/Prototype here:

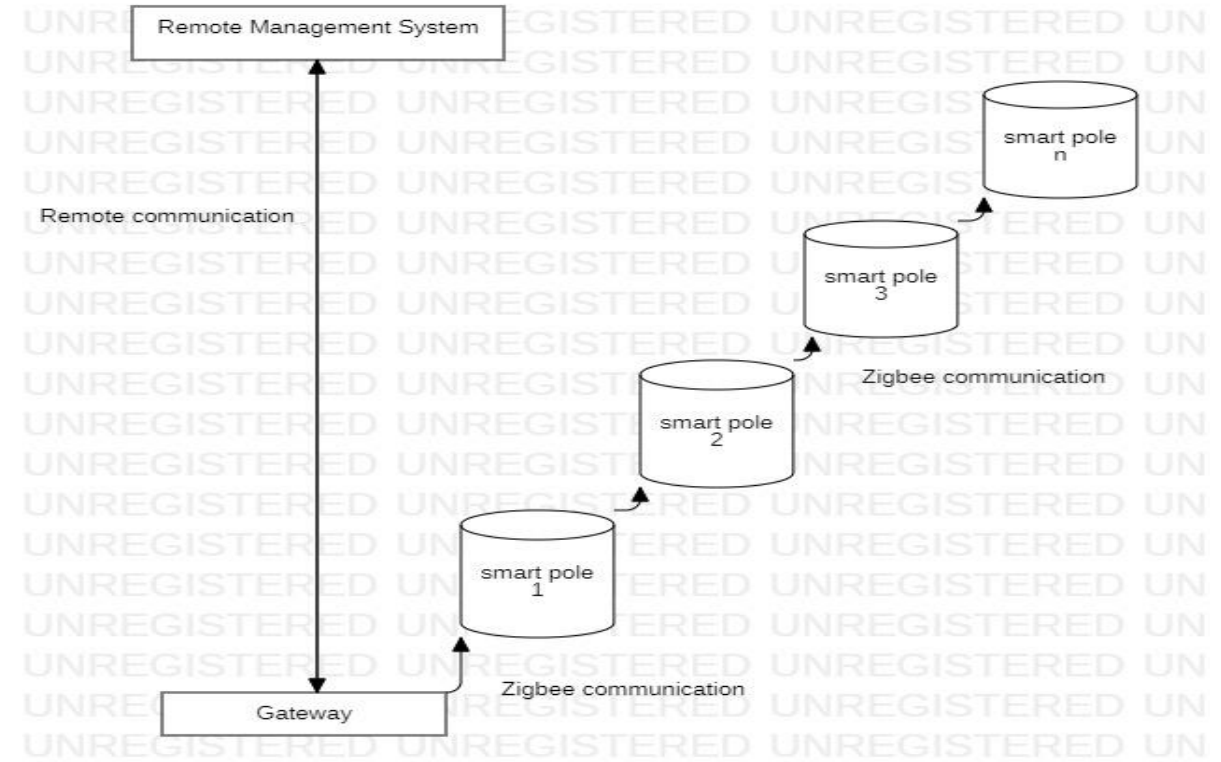
- ❑ Automated public lighting systems play an important role in energy consumption reduction. The advancement in wireless networks, control systems, sensors, embedded systems, and IoT made it possible to design automated public lighting systems with smart technologies, where crucial issues like energy savings and cost reduction can be efficiently dealt with. The proposed system is focused on automated public lighting infrastructure. Here, the main idea is to maintain the lamps' brightness at their minimum allowable level in a certain segment of the street that is compatible with national/regional standards and/or safety limits for both vehicular and pedestrian traffic.
- ❑ The smart infrastructure highlights the presence of the so-called wireless *smart pole*. A smart pole is a street light lamp mainly composed by a local control device, a LDR sensors, LiDAR sensors, weather sensors, communication devices and highly efficient LED lamps. The smart poles can exchange data (control commands and information requests) among them and, through a gateway, with a remote management web application. The overall cost of the investment in this type of smart lighting technology is low. The system is also capable of achieving good traffic monitoring performance.

❑ **Use Case Diagram** - <https://github.com/ankita430/Smart-India-Hackathon/blob/main/Automated%20public%20lighting.jpg>

❑ **System Architecture flow chart** - <https://github.com/ankita430/Smart-India-Hackathon/blob/main/Automated%20Public%20Lighting%20Architecture.jpg>

❑ **Simulation code** - <https://github.com/ankita430/Smart-India-Hackathon/blob/main/code%20repo>

❑ **Conference Paper** - <https://github.com/ankita430/Smart-India-Hackathon/blob/main/Automated%20Public%20Lighting.pdf>



Describe your Technology stack here:

- Wireless smart poles
- Local communication devices based on IEEE 802.15.4
- Zigbee communication protocol
- Remote management station
- Remote communication based on 3G/4G/Wi-Fi communication
- LDR and LiDAR sensors, Raspberry Pi
- Lighting control system

Idea/Approach Details

Describe your Use Cases here

Smart Lighting Control: LDRs can detect ambient light levels, allowing the smart pole to automatically adjust the intensity of street lighting based on real-time conditions. LiDAR sensors can further refine this by detecting the presence of pedestrians, vehicles, or cyclists, illuminating areas only when needed for added energy efficiency and safety.

Pedestrian Safety: LiDAR sensors can identify pedestrians at crosswalks, and when coupled with LDR data, they can activate warning signals or pedestrian-activated crosswalk lights when ambient light is low, enhancing pedestrian safety.

Security and Surveillance: LDRs can trigger LiDAR-enabled security cameras when lighting conditions change unexpectedly, helping to capture clear images and video footage during low-light situations for improved security.

Navigation Assistance for the Visually Impaired: Smart poles equipped with LiDAR sensors can aid the visually impaired by detecting obstacles in their path and providing audio or tactile feedback for safer navigation.

Describe your Dependencies / Show stopper here

- <https://www.mdpi.com/916592>
- [https://www.researchgate.net/publication/348264646 AUTOMATED STREET LIGHTING SYSTEM FOR ENERGY CONSERVATION](https://www.researchgate.net/publication/348264646_AUTOMATED_STREET_LIGHTING_SYSTEM_FOR_ENERGY_CONSERVATION)
- [https://www.researchgate.net/publication/225007897 Wireless Streetlight Control System](https://www.researchgate.net/publication/225007897_Wireless_Streetlight_Control_System)

Team Member Details

Team Leader Name: Ankita Gupta

Branch - M.tech: Stream - EnTc : Year - I

Team Member 1 Name: Sailesh Kumar Pasam

Branch - Mtech: Stream - EnTc : Year - I

Team Member 2 Name: Kshitij Ram Bhosale

Branch - Mtech: Stream - Robotics : Year - I

Team Member 3 Name: Siddhesh Waigankar

Branch – Mtech: Stream- Robotics: Year - I

Team Member 4 Name: Atharva Phand

Branch – Mtech: Stream – Robotics: Year – I

Team Member 5 Name: Aniketh Mehta

Branch – Mtech: Stream - EnTc : Year – I

Team Mentor 1 Name: Dr. Paresh Nasikkar

Category - Academic: Expertise - Solar: Domain Experience 10+ years:

Team Mentor 2 Name: Type Your Name Here

Category (Academic/Industry): Expertise (AI/ML/Blockchain etc): Domain Experience (in years):

Important Pointers



Please ensure below pointers are met while

- Kindly keep the maximum slides limit to 4 pages
- All the topics should be utilized for description of your idea
- Try to avoid paragraphs and post your idea in points
- Keep your explanation precisely and easy to understand
- Idea should be unique and novel. If it has a business potential more weightage will be given.
- Apart from this PPT abstract of your idea will be asked separately while submitting
- You need to save the file in PDF and upload the same on portal. No PPT, Word Doc or any other format will be supported
- You can delete this slide (Important Pointers) when you upload the details of your idea on SIH portal.